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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/655,389 | 09/04/2003 | Michael G. Butler | 5500-97300 | 6654 |

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EXAMINER

DOAN, DUC T

ART UNIT PAPER NUMBER

2188

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/655,389

Applicant(s)

BUTLER ET AL.

Examiner

Duc T. Doan

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/16/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

Claims 1-21 are in the application.

Claims 1-21 are rejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

A person shall be entitled to a patent unless -

(a) the invention was known or used by other's in this country or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-6,8-13,15-20 rejected under 35 U.S.C. 102 (e) as being anticipated by Mathews et al (US 6678815).

As for claim 1, Mathews describes a method comprising: generating a next virtual fetch address corresponding to an instruction fetch request (Mathews's column 3 lines 10-15); determining whether a current physical address translation is valid for said next virtual fetch address in response to said generating, wherein said determining comprises detecting a change in the virtual page number of said next virtual fetch address relative to a virtual page number of a current virtual fetch address (Mathews's column 4 lines 41-50); activating an ITLB circuit in response to determining that said current physical address translation is not valid for said next virtual fetch address (Mathews's column 4 lines 19-23) ; and performing said instruction fetch using said current physical address translation without activating said ITLB circuit in response to determining that said current physical address translation is valid for said next virtual fetch address (Mathews's column 4 lines 47-56).

As for claim 2, Mathews describes wherein said determining that said current physical address translation is not valid for said next virtual fetch address further comprises detecting an ITLB update operation (Mathews's column 5 lines 5-10;).

As for claim 3, Mathews describes wherein said detecting an ITLB update operation further comprises determining that an ITLB entry being modified corresponds to said current physical address translation (Mathews's column 7 lines 5-32).

As for claim 4, Mathews describes wherein said generating said next virtual fetch address comprises incrementing said current virtual fetch address by a fetch increment value (Mathew's column 5 lines 1-12), and wherein detecting a change in the virtual page number comprises

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detecting an arithmetic carry out of said incrementing at a bit position corresponding to a current virtual page size (Mathews describes incrementing current fetch address to generate the next fetch address, and determining the next address not crossing a page boundary; Mathews's column 5 lines 4-11).

As for claim 5, Mathews describes wherein said generating said next virtual fetch address comprises selecting a branch target address, and wherein said detecting a change in the virtual page number comprises detecting a difference between a virtual page number of said branch target address and a virtual page number of said current virtual fetch address (Mathews's column 4 lines 20-25; Fig 3: #32).

As for claim 6, Mathews describes wherein said generating said next virtual fetch address comprises selecting a branch target address, and wherein said detecting a change in the virtual page number comprises receiving branch prediction information indicative of a virtual page transition (Mathews's column 3 line 38 to column 4 lines 55).

Claims 8,15 rejected based on the same rationale as in the rejection of claim 1.

Claims 9,16 rejected based on the same rationale as in the rejection of claim 2.

Claims 10,17 rejected based on the same rationale as in the rejection of claim 3.

Claims 11,18 rejected based on the same rationale as in the rejection of claim 4.

Claims 12,19 rejected based on the same rationale as in the rejection of claim 5.

Claims 13,20 rejected based on the same rationale as in the rejection of claim 6.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7,14,212 rejected under 35 U.S.C. 103(a) as being unpatentable over Mathews et al (US 6678815) as applied to claims 1,8,15 respectively, and in view of Nogami (US 5860145).

As for claim 7, Mathew does not describe the claim's detail of buffering. However, Nogami describes buffering one or more physical address translations (Nogami's Fig 5: #5(n)), and wherein said determining whether a current physical address translation is valid for said next virtual fetch address further comprises: determining whether a given buffered physical address translation is valid for said next virtual fetch address (Nogami's column 5 lines 18-25); and selecting said given buffered physical address translation as said current physical address translation in response to determining that said given buffered physical address translation is valid for said next virtual fetch address ((Nogami's column 5 lines 10-42) . It would have been obvious to one of ordinary skill in the art at the time of invention to include registers as suggested by Nogami in Mathews's system to reduce TLB activation thereby further reducing power consumption (Nogami's column 4 lines 52-65).

Claims 14,21 rejected based on the same rationale as in the rejection of claim 7.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yoshioka (US 6324634).

When responding to the office action, Applicant is advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc T. Doan whose telephone number is 571-272-4171. The examiner can normally be reached on M-F 8:00 AM 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin L. Ellis
Primary Examiner

Kevin L. Ellis